

REMARKS

Claims 7-15 are pending in the present application. As will be discussed below, the specification has been amended. No new matter has been added. Accordingly, entry of the present Amendment is requested.

Referring to page 2 of the Office Action, the disclosure has been objected to on the basis that the specification needs to be updated as to the status of the divisional application (U.S. Application No. 08/860,960, now U.S. Patent No. 6,342,632).

The sentence added on the first page of the specification in the Preliminary Amendment filed April 5, 1999, has been amended to update the status of the divisional application. Accordingly, withdrawal of this rejection is requested.

Additionally, Claims 10 and 14 have been rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 3,232,982 to Finneran *et al.*

Finneran is relied upon to disclose a urea production apparatus comprising "a urea synthesis reactor (2), a high pressure stripping unit (14), means for feeding a reaction mixture (12) from the reactor (2) to the stripping unit (14), means for condensing vapors of the stripping unit (14), means for recycling a portion of carbamate (4, 16,20) to the reactor (2), a recovery section (22) for separating urea (28) and a second portion of carbamate from the stripping unit (14), and a means for feeding the second portion of carbamate (23, 25, 26) to the stripping unit (14)."

Applicants respectfully traverse this rejection for the following reasons.

Many of the features recited in present claim 10 are not disclosed or suggested by Finneran *et al.* In particular, the first heating and carbamate condensing zone 14 is not a high

pressure unit operating at a pressure substantially corresponding to the pressure in the synthesis reactor (urea reacton zone 2) as recited in present Claim 10.

In fact, zone 14 operates at a pressure between about 150-400 psi (*i.e.* 10.2-27.2 atm) that is drastically lower than the pressure between about 1700-3500 psi (*i.e.*, 116.6-238.2 atm) in the reaction zone 2. *See*, Finneran *et al.*, column 5, lines 42-44 and 60-61. In the urea field, the pressure operating range of zone 14 is called "medium pressure" (see, the present description, page 9, lines 16-17), while the pressure in the reaction zone 2 is called "high pressure" (*see*, present description, page 8, lines 17 and 25).

Moreover, in Finneran *et al.* the reaction mixture leaving the urea reaction zone 2 is first fed to a pressure reduction zone 10 (to expand its pressure from "high-pressure" values to "medium pressure" values as explained above) and then fed to the (medium pressure) first heating and carbamate condensing zone 14. *See*, Finneran *et al.* the figure and column 5, lines 55-58.

Therefore, in the prior art there is no disclosure or suggestion of the third feature of present Claim 10, wherein means are provided for directly feeding the reaction mixture from the (high pressure) synthesis reactor to the high pressure stripping unit.

Also, the last feature of present Claim 10 is not taught or suggested by the cited prior art, since in Finneran *et al.*, the carbamate formed in the second heating and carbamate condensing zone 22 is clearly and unambiguously fed to the carbamate condensing portion of zone 14 and not to the heating portion thereof (*i.e.*, the stripping unit of Claim 10).

Zone 14 has the double function of - decomposing by heat ammonium carbamate contained in the reaction mixture, thus separating the so obtained vapors (carbon dioxide,

ammonia and water) from a urea solution that is fed to the second zone 22, and therefore -
condensing these vapors to reform ammonium carbamate (carbamate condensate) that is recycled to the urea reaction zone 2 (*see*, Finneran *et al.* column 5, line 60 to column 6, line 5). These two distinct functions are (and have to be) carried out in respective distinct portions of zone 14. In other words, although not represented in the schematic drawing, zone 14 should be considered as being subdivided in two different portions, one for heating (*i.e.*, stripping) the reaction mixture and the other for condensing the so obtained vapors. If these two portions of zone 14 were separated, it would have been impossible - for instance - to withdraw from zone 14 a first liquid flow of urea solution to be fed to zone 22 (line 24) and a distinct second liquid flow of carbamate condensate to be recycled to the reaction zone 2 (line 16). The same explanation is also valid for zone 22.

By considering the stripping unit 2 and the means 6 for condensing of the present invention as belonging to zone 14 of Finneran *et al.*, the Examiner has implicitly admitted that such zone is made of two structurally distinct parts (*see*, Office Action, point 4).

Having this in mind, it results clearly and unambiguously that the reformed carbamate solution obtained in zone 22 and returned by line 26 to the ammonium carbamate condensate present in zone 14, as described in Finneran *et al.*, at column 6, lines 11-14, can only be fed to the carbamate condensing portion of zone 14 that is the only portion of zone 14 where carbamate condensate is present, and not to the heating portion where carbamate condensate cannot be present since, otherwise, it would be subjected to decomposition (vaporization).

On the contrary, according to the present invention, the carbamate solution formed in the urea recovery section is advantageously fed to the stripping unit (that can be compared to the

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heating portion of zone 14) instead of being fed to the condensing means 6, as in the prior art.

So doing, the formed carbamate is further decomposed together with the carbamate contained in the reaction mixture and the so obtained vapors are then condensed in the condensing means and recycled to the synthesis reactor with a very low water content, thereby increasing its conversion yield (*see*, description, page 3, lines 19-28). This teaching is clearly not contained in the prior art.

From the above, it is clear that the subject-matter of present Claim 10 is new and unobvious from the cited prior art. The same arguments also apply to independent Claim 14. Accordingly, withdrawal of the rejection is requested.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

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The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,


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APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

The specification is changed as follows:

Page 1, first paragraph.

Technical Field

This application is a divisional of application serial number 08/860,960 filed June 24, 1997, now U.S. Patent No. 6,342,632. In its general aspect the present invention relates to a process for urea production.